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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/648,937 | 08/26/2003 | James L. Hadder | H0004989 | 5923 |

7590 11/09/2005

Honeywell International, Inc.
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Morristown, NJ 07962-9806

EXAMINER

RODRIGUEZ, WILLIAM H

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

3746

DATE MAILED: 11/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/648,937

Applicant(s)

HADDER, JAMES L.

Examiner

William H. Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 and 19-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-18, 25-27 and 29 is/are rejected.
- 7) ☒ Claim(s) 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

FINAL REJECTION

This office action is in response to the amendment and remarks filed 9/19/05.

Claim Rejections - 35 USC § 102

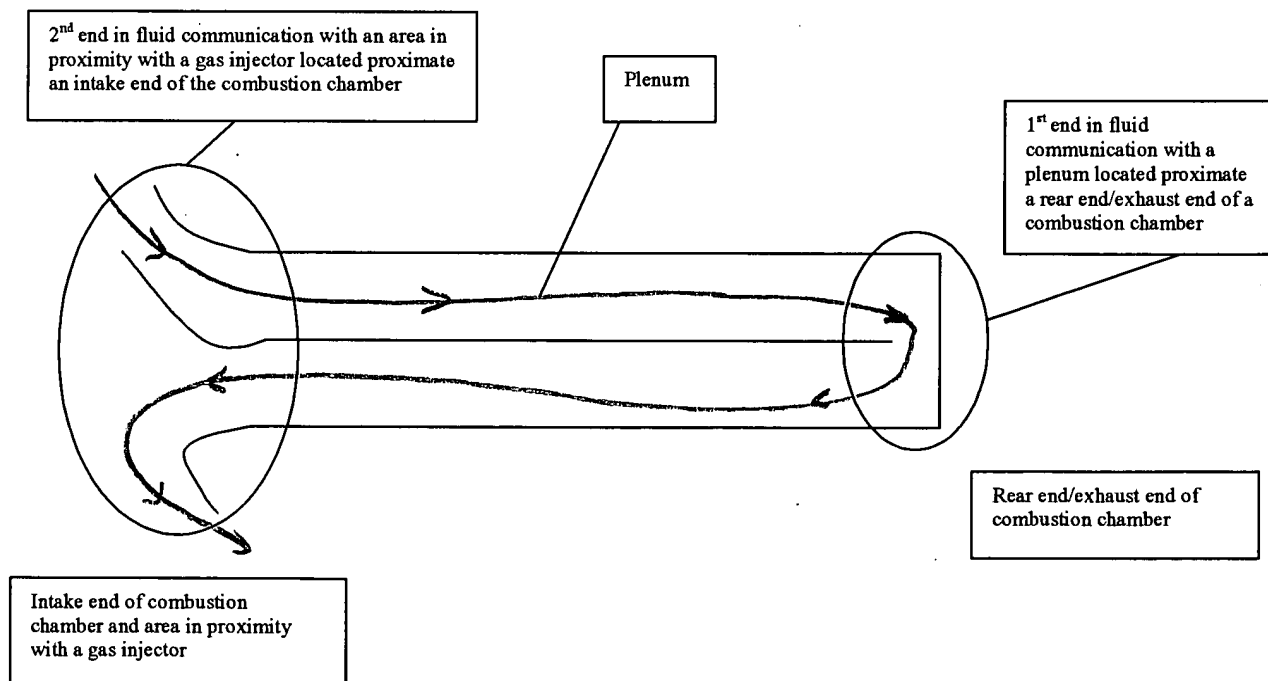
- The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

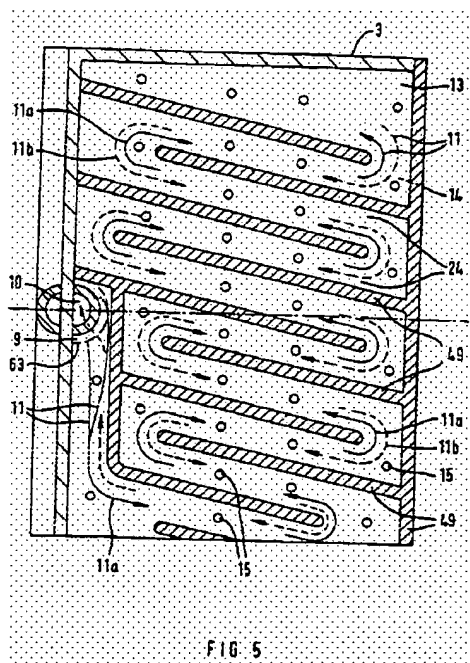
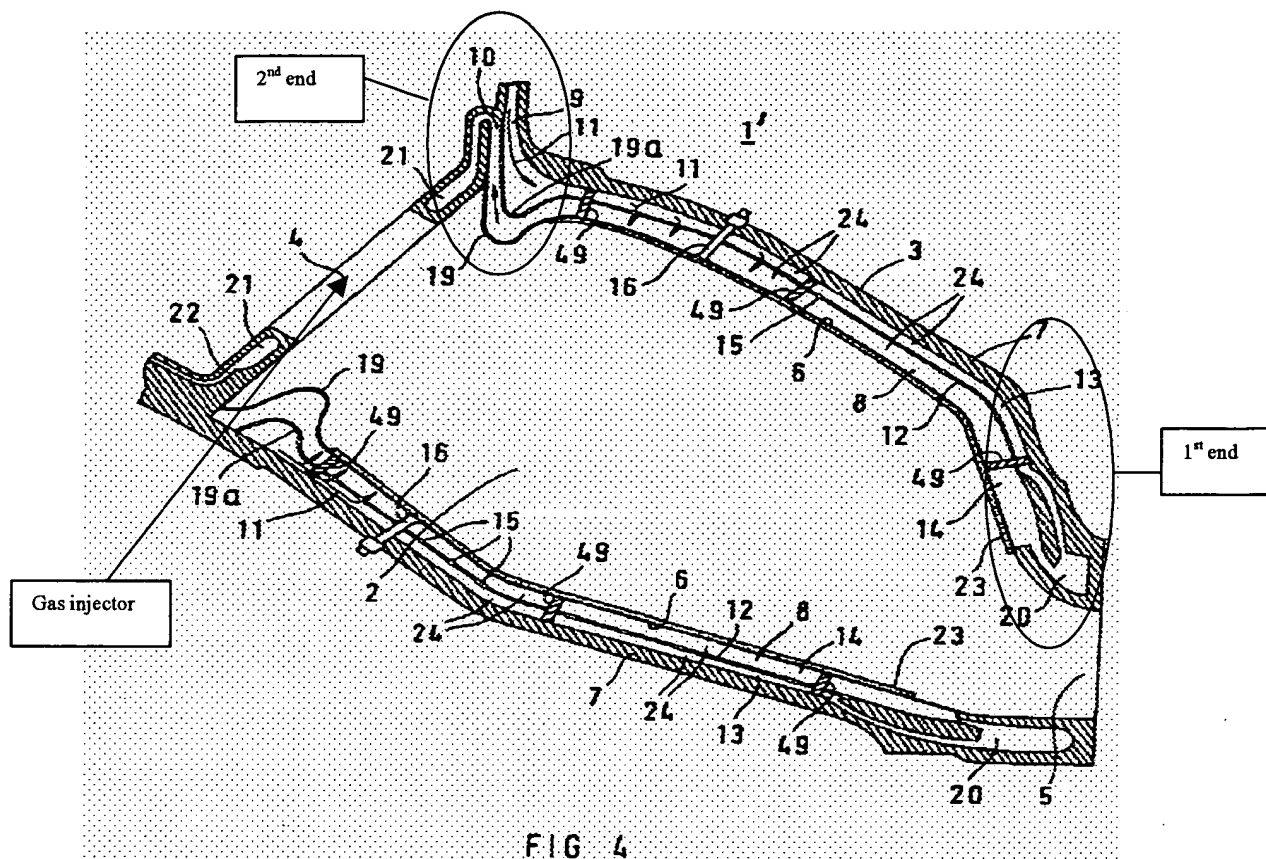
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- Claims 14-18 are rejected under 35 U.S.C. 102(b) as being anticipated by **Liebe (US 6,341,485)**.

Note: Since applicant has removed the limitation “supplying air” from claim 14. Now the previously used reference to **Liebe’485** by itself anticipates the invention as claimed





Figures 4 and 5 of Liebe

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With respect to claim 14, **Liebe** teaches a cooling tube assembly for cooling a liner (3, 6) of a combustor chamber of a gas turbine engine, the assembly comprising: a plurality of serpentine cooling tubes (13, 14), each serpentine tube conforming to a contour of the liner, each serpentine tube including: a first end in fluid communication with a plenum located proximate and exhaust end of the combustion chamber, and a second end in fluid communication with an area in proximity with a gas injector of the gas turbine engine located proximate an intake end of the combustor chamber, each serpentine cooling tube supported by a plurality of pins 16 to maintain the serpentine cooling tube at a spaced distance from the liner, and each pin 16 having a proximal end attached to the cooling tube and a distal end inserted through the liner. See particularly **Figures 4, 5** of **Liebe** above.

*The desired result recitation “the distal end being secured from removal from the hole in a manner allowing rotational movement of the pin within the hole” is not given patentable weight because the recitation does not further limit the claim and does not help differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims, as is the case here.

With respect to claim 15, **Liebe** teaches each cooling tube is fabricated of a metallic material, and the proximal end is secured to the liner. The recitation “by brazing” is rejected over a prior art product that appears to be identical, although produced by a different process, the burden is upon the applicants to come forward with evidence establishing an unobvious difference between the two. See *In re Marosi*, 218 USPQ 289 (Fed. Cir. 1983)

With respect to claim 16, **Liebe** teaches that the cooling tube 14 is positioned on an exterior side of the liner 6. See particularly **Figure 4** of **Liebe**.

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With respect to claim 17, **Liebe** teaches that the cooling tube 13 is positioned on an interior side of the liner 3. See particularly **Figure 4** of **Liebe**.

With respect to claim 18, **Liebe** teaches that the serpentine shape of each tube is formed as a plurality of alternating bends along a length of each tube. See particularly **Figure 4** of **Liebe**.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8-13, 25-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Liebe (US 6,341,485)** in view of **Peterson et al. (US 2,446,059)**.

With respect to claims 8, 9 and 11, **Liebe** teaches a cooling tube assembly for cooling a liner (3, 6) of a combustor chamber of a gas turbine engine, the assembly comprising: a plurality of serpentine cooling tubes (13, 14), each serpentine tube conforming to a contour of the liner, each serpentine tube including: a first end in fluid communication with a plenum *and located proximate a rear end/exhaust end of the combustor chamber*, the plenum supplying a fluid to cool the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector of the gas turbine engine *and located proximate a front end/intake end of the combustor chamber*, and a centerline extending from the first end to the second end, wherein the centerline, the first end, and the second end are non-linear when projected onto a plane, wherein

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each cooling tube has a serpentine shape (see column 5 lines 53 to column 6 line 6) conforming to a contour of the liner (see particularly **Figures 4, 5** of Liebe). **Liebe** does not mention that the cooling fluid supplied to the serpentine cooling tubes (13, 14) is air but steam. However, **Liebe** does not restrict supplying the serpentine cooling tubes with steam only, but he only mentions that steam is preferred (column 6 line 66 of Liebe). Nevertheless, **Peterson** teaches an apparatus similar to **Liebe** comprising a cooling tube 37 for cooling a liner 41 of a combustor chamber of a gas turbine engine, comprising: the cooling tube having a first end in fluid communication with a plenum supplying air to the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector 30 of the gas turbine engine, wherein the cooling tube has a serpentine shape conforming to a contour of the liner and the serpentine shape of the cooling tube allows the cooling tube to expand and contract in response to temperature gradients in the combustor chamber (see particularly **Figures 2-4** of Peterson). Therefore, **Peterson** teaches that it was well known to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used air as a cooling fluid for a combustor being cooled by serpentine cooling tubes. Thus, as taught by **Peterson** and since Liebe does not restrict his invention to steam, it would have been obvious to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used the teachings of Peterson and have supplied Liebes' serpentine cooling tubes 13, 14 with air because air was a well known and commonly used cooling fluid for cooling combustor liners.

*The desired result recitation "the serpentine shape of the cooling tube **allows** the cooling tube to expand and contract in response to temperature gradients in the combustor chamber" is not given patentable weight because the recitation does not further limit the claim and does not

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help differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims, as is the case here.

With respect to claim 10, **Liebe** teaches that the cooling tube 14 is positioned outside the combustor chamber liner 3. See particularly **Figure 4** of **Liebe**.

With respect to claim 12, **Liebe** teaches the cooling tube assembly is in contact with the liner (3, 6). See particularly **Figure 4** of **Liebe**.

With respect to claim 13, **Liebe** teaches that the cooling tube is maintained a spaced distance from the liner. See particularly **Figure 4** of **Liebe**.

With respect to claims 25-27 and 29, **Liebe** teaches a cooling tube assembly for cooling a liner (3, 6) of a combustor chamber of a gas turbine engine, the assembly comprising: a plurality of serpentine cooling tubes (13, 14), each serpentine tube conforming to a contour of the liner, each serpentine tube including: a first end in fluid communication with a plenum *and located proximate a rear end/exhaust end of the combustor chamber*, the plenum supplying a fluid to cool the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector of the gas turbine engine *and located proximate a front end/intake end of the combustor chamber*, and a centerline extending from the first end to the second end, wherein the centerline, the first end, and the second end are non-linear when projected onto a plane, wherein each cooling tube has a serpentine shape (see column 5 lines 53 to column 6 line 6) conforming to a contour of the liner (see particularly **Figures 4, 5** of **Liebe**). **Liebe** does not mention that the cooling fluid supplied to the serpentine cooling tubes (13, 14) is air but steam. However, **Liebe** does not restrict supplying the serpentine cooling tubes with steam only, but he only mentions

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that steam is preferred (column 6 line 66 of Liebe). Nevertheless, **Peterson** teaches an apparatus similar to **Liebe** comprising a cooling tube 37 for cooling a liner 41 of a combustor chamber of a gas turbine engine, comprising: the cooling tube having a first end in fluid communication with a plenum supplying air to the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector 30 of the gas turbine engine, wherein the cooling tube has a serpentine shape conforming to a contour of the liner and the serpentine shape of the cooling tube allows the cooling tube to expand and contract in response to temperature gradients in the combustor chamber (see particularly **Figures 2-4** of Peterson). Therefore, **Peterson** teaches that it was well known to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used air as a cooling fluid for a combustor being cooled by serpentine cooling tubes. Thus, as taught by **Peterson** and since Liebe does not restrict his invention to steam, it would have been obvious to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used the teachings of Peterson and have supplied Liebes' serpentine cooling tubes 13, 14 with air because air was a well known and commonly used cooling fluid for cooling combustor liners. Since Liebe in view of Peterson has the same structure as claimed, it is inherent that Liebe in view of Peterson device would be able to perform the recited method steps.

Response to Arguments

5. Applicant's arguments filed 8-18, 25-27 and 29 have been fully considered but they are not persuasive because of the following reasons.

On page 10 of the response, applicant argues that applicant's inventive cooling tube has a one-way flow of cooling fluid in contrast to counter flow of air in Liebe. Further, there is no inclusion in the applicant's device of a dual cooling space structure including a rigid structure that is not able to withstand thermal growth. The applicant device includes the serpentine of the single cooling space.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., single cooling space device) are not recited in the rejected claim(s). *Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Moreover, the recitations "a first end and located proximate a rear end/exhaust end of the combustor chamber, and a second end and located proximate a front end/intake end of the combustor chamber," now included/added in the independent claims are still anticipated by Liebe as clearly explained above in the rejections.

Note: Just by adding the word a single space cooling device to the independent claims does not place the case or the claims in condition for allowance.

Allowable Subject Matter

6. Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

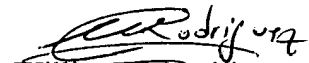
Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Rodriguez whose telephone number is 571-272-4831. The examiner can normally be reached on Monday-Friday 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on 571-272-4444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William H. Rodriguez 11/7/05
Primary Examiner
Art Unit 3746